SCIENCE

POPULATION STATUS OF NESTING LAUGHING GULLS IN THE UNITED STATES 1977–1991

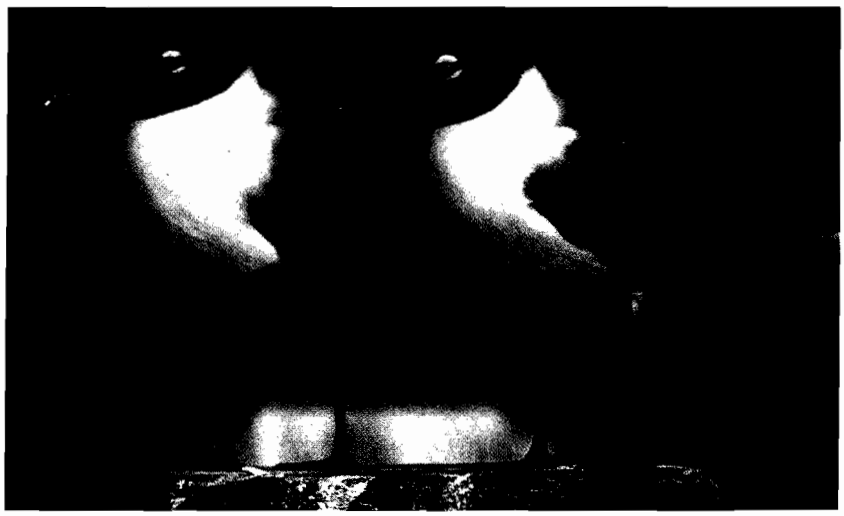
by Jerrold L. Belant and Richard A. Dolbeer

Gulls (*Larus* spp.) frequently have been reported as a serious hazard to aircraft (Dahl 1984, Kull 1984, Seubert 1990, Sherigalin 1990). An increase in Laughing Gull (*Larus atricilla*) collisions with aircraft at John F. Kennedy International Airport (hereafter, JFK) during recent years (Dolbeer *et al.*, 1989), and the ineffectiveness of alternate techniques for control (Sillings *et al.*, 1992), prompted an interim gull management program conducted by United States Department of Agriculture biologists during 1991 and 1992. During this program, biologists collected 14,191 (1991) and 11,847 (1992) Laughing Gulls as the birds flew over the airport. About 94% of these gulls (13,209, 1991; 11,278, 1992) were ≥two-years old. The program resulted in a 68% (1991) and 87% (1992) reduction in Laughing Gull collisions with aircraft at JFK compared to 1988–1990 levels (Dolbeer *et al.*, 1993). Prior to this management program, Dolbeer *et al.* (1989) had determined that the estimated Laughing Gull nesting population from New Jersey to Maine had increased from about 60,000 adults during the late 1970s to more than 120,000 adults by the late 1980s. To further evaluate Laughing Gull population dynamics in relation to current management programs to reduce Laughing Gull collisions with aircraft, we obtained estimates of the number of nesting Laughing Gulls for states and provinces along the Atlantic and Gulf Coasts of the United States and Canada between 1977 and 1991.

Our specific objectives were to: (1) obtain the most recent population estimates of nesting Laughing Gulls available to determine population trends and rates of growth in the United States and Canada since 1977 and, (2) to evaluate the impact of Laughing Gull control measures at JFK on local, regional, and national populations.

Methods

Previous estimates (1977–1986) for nesting pairs of Laughing Gulls were obtained from Erwin and Korschgen (1979), Buckley and Buckley (1984), Spendelow and Patton (1988), and Andrews (1990). To obtain recent (1987–1991) population estimates, we conducted telephone interviews from January to April 1992 with biologists from coastal states and provinces from Texas to eastern Canada when publications or reports were unavailable. Information requested included the number of nesting pairs and colonies present and the survey technique used to obtain the estimate.



Laughing Gulls

PHOTOGRAPH: HELEN CRUICK SHANK/VIREO

Results: United States and Canada Population Estimates

The current (1990) total population of nesting Laughing Gulls in the United States is approximately the same as during the late 1970s (258,851 *vs.* 249,001 pairs, respectively, about 0.3 mean per-

dance along the North Platte River in western Nebraska.

Although elegant fliers, cranes have adapted to spend most of their lives on the ground. With only a vestigial hallux, Whoopers and Sandhills cannot perch, so they roost on islands or sandbars. Most flights are commutes from the roost to nearby grassland or field to forage.

Swifts, by contrast, have adapted to live almost exclusively in the air. By some estimates, a Chimney Swift can fly 135,000 miles a year—about the equivalent of five and a half flights around the globe. Some Chimney Swifts breed in North Dakota and winter in Chile. Swifts feed, court, and mate on the wing. Studies of Common Swifts using radar and bird-mounted altimeters show they can stay aloft night and day. They need not alight even to construct a nest. Chimney Swifts can snap off twigs in flight, says biologist Charles T. Collins, who has studied western swifts for two decades.

As an aerialist, the swift has evolved feet tiny enough to disappear into its plumage, enhancing the bird's aerodynamics. Contracted, a Chimney Swift's foot may be little larger than a grain of rice—half the size of the foot of a smaller warbler. The scientific name for the swift family, Apodidae, means "no feet" in Latin.

Its diminutive feet make the swift awkward on the ground but not helpless, says Collins, a professor at California State University at Long Beach. All swifts can perch on their own nests, or grip crevices in caves or chimneys. Palm Swifts of the Caribbean and South America can climb palm fronds, using a side-to-side grip that Collins likens more to that of a chameleon or a koala than to any known bird. Other members of the Palm Swift's subfamily, the Common Swift of Europe and the White-throated Swift of the American West, share the unique grip.

The Emperor Penguin can neither perch nor climb, and it "flies" through water rather than air. Yet no bird puts its feet to more generous use. The Emperor's feet guard its egg, and later, its young from some of the most hostile weather on the planet. In the Antarctic autumn, the female Emperor lays a single egg on the sea ice, then plunges into the sea for an extended fishing trip.

Left behind, the male cradles the one-pound egg on the top of its feet, tucking it under a large fold of belly skin like a downy muff. Throughout the next two months of a continuously dark Antarctic winter, as the ice underfoot thickens and the air temperature may fall to -70°F amid howling winds, this paternal womb keeps the egg at a toasty 97°F. After the egg hatches, the young penguin rides upon its parents' feet as if they were a cradle and the muff were a copious comforter.

In this way, the Emperor puts its toes to the task of the survival of its species—a task fundamentally little different from that of a grebe courting its mate, or an Osprey delivering to its nestlings a gasping, defeated herring.

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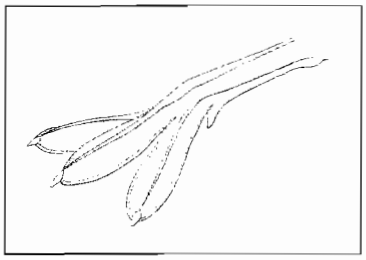
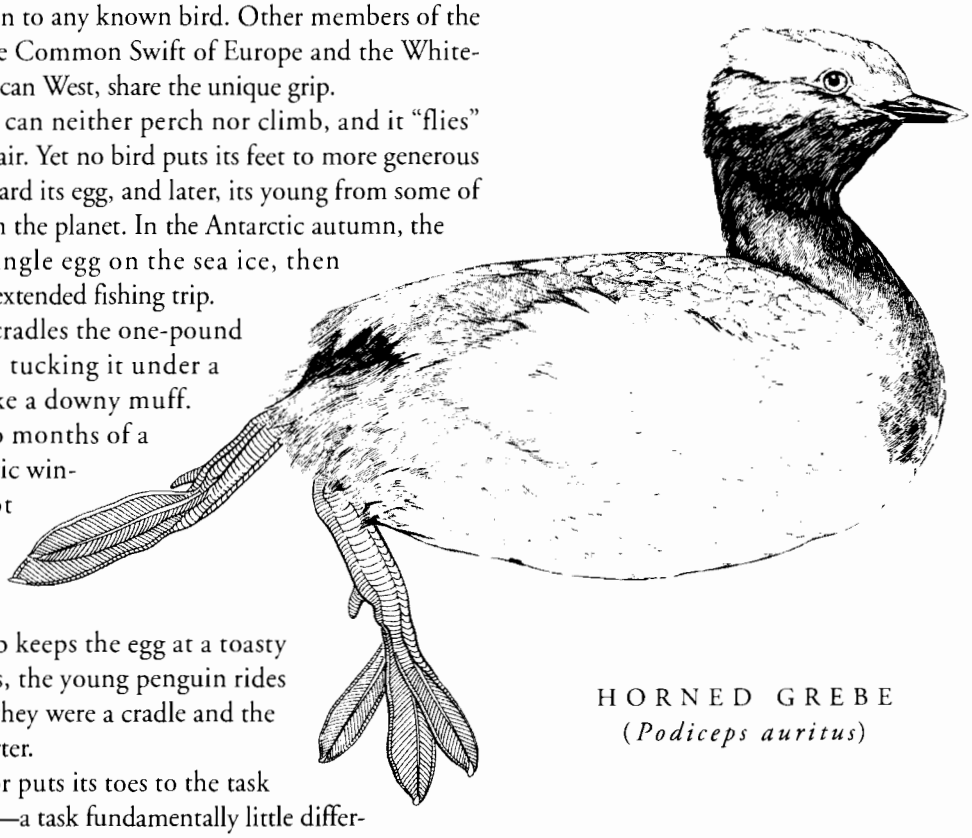


Grebes have lobed feet which are placed far back on its body. This gives the bird maximum power while diving. Above, the foot of a Horned Grebe.



HORNED GREBE
(*Podiceps auritus*)

cent annual increase; Table 1). Laughing Gull populations in Gulf Coast states have remained stable or declined slightly since the late 1970s. In contrast, Laughing Gull populations have increased substantially in Delaware, New Jersey, New York, Massachusetts, and Maine. Andrews (1990) reported a 49% increase in the number of nesting Laughing Gulls from Maine to Virginia between 1977 and 1985; this represents about 5.1 mean percent annual increase. We estimate 0.9 and 3.5 mean percent annual increase for nesting Laughing Gulls from Maine to Virginia from 1985 to 1990, and 1977 to 1990, respectively.

No nesting Laughing Gulls were recorded in Connecticut, Georgia, Mississippi, New Hampshire, or Rhode Island between 1977 and 1991 (Portnoy 1977, Keller *et al.*, 1984, J. Victoria, Conn. Dep. Environ. Protect., Wildl. Div., pers. comm.; T. Johnson, Ga. Dep. Nat. Resour., pers. comm.; D. Ruple, Miss. Dep. Wildl. Conserv., pers. comm.; D. Delucca, N.H. Audubon, pers. comm.; J. E. Myers, R.I. Div. Fish and Wildl., pers. comm.). Laughing Gulls have not nested in eastern Canada since the early 1960s (Lock 1990).

Causes for population changes within a state suggested by biologists conducting the surveys included increased availability of putrescible wastes, interspecific competition, and habitat availability as influenced by natural and anthropogenic factors (*e.g.*, creation or destruction of dredge spoil islands). Modifications and refinements of techniques occurred frequently among surveys within states which affected the accuracy of Laughing Gull population estimates.

Select State Accounts

The following accounts are summaries of Laughing Gull populations, factors influencing gull population dynamics, and survey techniques used to estimate their populations within specific states as provided in reports or during interviews with biologists.

Nesting Laughing Gulls at Jamaica Bay Wildlife Refuge, New York City

Alabama: Nesting Laughing Gulls have been reported at only two locations in Alabama (Cooley 1987). A small colony nested on Blakely Island during 1979 (Cooley 1987) but has not been active since. The second colony is located on Gaillard Island, a man-made dredge disposal island in Mobile Bay that has been active since 1983. The estimated number of nesting pairs on Gaillard Island has fluctuated considerably since the first estimate in 1985 (1500 pairs). These fluctuations are in part attributed to: use of different survey techniques, difficulty in locating some nests and in estimating the total number of nests because of asynchronous nesting, and annual fluctuations in the availability of suitable nesting habitat (R. Clay, Ala. Dep. Conserv. and Nat. Resour., pers. comm.). The size of Gaillard Island and the amount of available nesting habitat are affected by dredging activities which vary considerably between years. A delay in censusing nests during 1991 resulted in a probable low population estimate (R. Clay, pers. comm.). Total ground counts were used to estimate nesting population size during 1990 and 1991.

Delaware: No recent formal survey for nesting Laughing Gulls has been conducted in Delaware. The 1991 population estimate of about 2000 nesting pairs was an aerial estimate of the East Rehobeth Bay concentration. This is the largest of several known concentrations of nesting Laughing Gulls in Delaware (L. Gelvin-Innvaer, Del. Dep. Nat. Resour., pers. comm.). An increase in putrescible waste, immigration from New Jersey colonies, and the effectiveness of Laughing Gulls as competitors with other colonial waterbirds for nest sites are considered primary factors for the population increase (L. Gelvin-Innvaer, pers. comm.).

Florida: No recent formal survey for Laughing Gulls has been conducted in Florida and none are anticipated (D. Runde, Fla. Game and Fresh Water Fish Comm., pers. comm.). The estimate for nesting Laughing Gulls

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in the Tampa Bay-Clearwater concentration (four colonies; Paul and Below 1991) was determined by walking the perimeter of the concentration and estimating the number of gulls observed (R. Paul, Nat. Audubon Soc., Tampa, Florida, pers. comm.). Paul and Below (1991) mentioned five additional colonies that contained between several hundred and several thousand nesting pairs each. Patton and Hanners (1984) estimated 50,300 and 48,700 pairs of nesting Laughing Gulls in Tampa Bay during 1981 and 1982, respectively.

Georgia: Surveys for Laughing Gulls had not been conducted and no known colonies had been observed. Georgia Department of Natural Resources personnel intended to conduct intensive surveys of nesting colonial waterbirds during 1992 (J. Ozier, Ga. Dep. Nat. Resour., pers comm.).

Louisiana: From April through June 1990, Louisiana Department of Wildlife and Fisheries personnel used aerial and ground surveys to estimate the number of breeding pairs of Laughing Gulls (Martin and Lester 1990).

Maryland: Nesting Laughing Gull populations have declined dramatically since 1977. Estimates for nesting pairs (number of colonies) during 1989 and 1990 are 40 (1) and 0 (0), respectively (D. Brinker, Md. Dep. Nat. Res., pers. comm.). Gull populations are estimated using total ground counts of nests during May. Apparent causes for the decline include competition with Herring Gulls (*Larus argentatus*), loss of nesting habitat through washout of barrier islands, depredation by Red Fox (*Vulpes vulpes*), after islands used by nesting gulls became connected to the mainland by shifting sands, and destruction of nesting habitat by grazing feral horses (D. Brinker, pers. comm.).

New Jersey: Laughing Gulls are the most common colonial nesting waterbird in New Jersey (Jenkins *et al.*, 1989). Adult gulls were counted at nesting colonies from a helicopter. Although adult Laughing Gull populations have fluctuated within regions, the statewide population has remained relatively constant since 1979 (Jenkins *et al.*, 1989). The 1989 population may have been underestimated because colonies on the front beaches were not surveyed as they had been during previous surveys (Jenkins *et al.*, 1989).

North Carolina: Nesting Laughing Gulls increased moderately (4.3%) between 1977 and 1989. Clapp and Buckley (1984) reported 22,904 nesting pairs in 1983. There were about 17,000 and 20,676 nesting pairs estimated during 1988 and 1989, respectively (J. Parnell, Univ. N.C., Wilmington, unpubl. data.). Total nest counts conducted from the ground are used to assess population size of small colonies; estimates of larger colonies are derived from sampling 20% of the colony and extrapolating. Population estimates for North Carolina are considered minimum estimates (J. Parnell, pers. comm.).

South Carolina: Total ground counts of nests with at least one egg and transect counts were used to estimate nesting population size during 1988 and 1989 (Wilkinson 1991). The Bull Bay concentration included 3966 nesting pairs in six colonies during 1987. There were seven colonies with 7288 estimated pairs statewide during 1988 and nine colonies with 6563 estimated pairs during 1989 (P. Wilkinson, S.C. Wildl. and Marine Resour. Dep., unpubl. data).

Texas: Breeding pairs were estimated from the ground within or adjacent to a colony, or from an aircraft. Statewide population estimates (number of colonies) for 1988 and 1989 were 68,977 (65) and 69,141 (56), respectively (Tex. Parks and Wildl. Dep. 1988, Martin 1989).

Virginia: An overall increase in the number of nesting Laughing Gulls on barrier islands in Virginia occurred between 1975 and 1987 although the statewide population remained stable (Va. Dept. Game and Inland Fish. 1989). The dynamics of these islands directly affect the amount of suitable nesting habitat which influences the size of the annual nesting population. Island dynamics also affect reproductive success by occasionally displacing nesting Laughing Gulls to areas occupied by mammalian predators; the predators subsequently depredate eggs and young (D. Bradshaw, Va. Dep. Game and Inland Fish., pers. comm.).

Discussion

The growth rate of the Laughing Gull population in the northeastern United States is likely attributable in part to Laughing Gull use of putrescible waste at sanitary landfills. Several state biologists suggested that increased deposition of refuse at landfills was responsible for increases in Laughing Gull populations. Landfills have been reported as an important food source for several species of gulls (Annett and Pierotti 1989, Hunt 1972, Monaghan 1978, Patton 1988), and Burger and Gochfeld (1983) have suggested that this additional food resource has contributed to increased reproductive success and reduced mortality. In contrast, the population decline in Florida may be related, in part, to a decrease in available putrescible waste. Patton (1988) noted a reduction in material at landfills in Florida due to recently constructed refuse incineration facilities, and stated that significant declines could occur in gull populations previously inflated by this food resource.

Assuming that reported population estimates are accurate, the 13,000 and 11,000 ≥two-year-old Laughing Gulls shot at JFK in 1991 and 1992, respectively, represented about 5–6% of the annual nesting population from Maine to Virginia, and 2–3% of

Table 1. Estimates of nesting pairs and population growth rates of Laughing Gulls along the Atlantic and Gulf Coast of the United States.

State	Year 1	Year 2	Year 3	Estimated number of nesting pairs (no. of colonies) Year 1	Year 2	Year 3	Mean percent annual increase Year 1–Year 2	Year 2–Year 3	Year 1–Year 3	Ref.[1]
Maine	1977	1986	1991	231 (6)	516 (6)	716 (9)	9.3	6.8	8.4	a, b, c
Massachusetts	1977	1984	1991	200 (1)	1,054 (1)	1,285 (1)	26.8	2.9	14.2	a, b, d
New York	1979	1985	1990	15 (1)	2,741 (3)	7,629 (1)	138.2	22.7	76.2	e, b, f
New Jersey	1977	1985	1989	30,730 (25)	58,192 (46)	58,796 (92)	8.3	0.3	5.6	a, b, g
Delaware	1977	1985	1991	96 (1)	1,280 (4)	≥2,000 (1)	38.2	≥7.7	≥24.2	a, b, h
Maryland	1977	1985	1991	2,229 (2)	792 (3)	25 (3)	-12.1	-43.8	-27.4	a, b, i
Virginia	1977	1984/85	1987	31,197 (28)	32,017 (36)	31,104 (63)	0.3 to 0.4	-1.0 to -1.4	-0.03	a, b, j
N. Carolina	1977	1983	1989	12,353 (21)	22,904	20,676 (13)	10.8	-1.7	4.4	k, l
S. Carolina	1977		1989	5,470 (3)		6,563 (9)			1.5	k, m
Florida	1977		1991	56,606 (32)		24,000 to 48,000			-1.2 to -5.9	k, n
Alabama	1977	1985	1991	0 (0)	1,500 (1)	≥250 (1)		≥-25.8		k, o
Louisiana	1977		1990	28,043 (19)		28,975 (19)			0.3	k, q
Texas	1977		1990	81,831 (52)		64,595 (65)			-1.8	k, r
US	≈1977		≈1990	249,001		258,851[2]			0.3	

[1] a = Erwin and Korschgen (1979), b = Andrews (1990), c = B. Allen, Me. Dep. Inland Fisheries and Wildlife, pers. comm., d = B. Blodget, Mass. Div. Fish & Wildl., pers. comm., e = Buckley and Buckley (1984), f = Griffin and Hoopes (1991), g = Jenkins et al. (1989), h = L. Gelvin-Innvaer, Del. Div. Fish & Wildl., pers. comm., i = D. Brinker, Md. Dep. Nat. Resour., unpubl. data, j = Va. Dep. Game and Inland Fish. (1988), k = Spendelow and Patton (1988), l = J. Parnell, Univ. N.C.-Wilmington, unpubl. data, m = P. Wilkinson. 1989 S.C. Annual Colon. Waterbird Survey, unpubl. data, n = Table 1 (Continued). Paul and Below (1991), o = R. Clay, Ala. Dep. Conserv. and Nat. Resour., unpubl. data, q = Martin and Lester (1990), r = Martin (1990). [2] US estimate for 1990 was calculated using the mean value for the Florida estimate (i.e., 36,000 pairs).

the total United States nesting population. Also, many of the state populations of Laughing Gulls from Maine to Virginia have been increasing at annual rates less than 5% since the late 1970s. Therefore, the authors believe that the shooting of Laughing Gulls flying over JFK in 1991 and 1992 to reduce collisions with aircraft has had minimal effect on regional or national populations. Additional information is required to adequately determine the impact that this shooting has had on local Laughing Gull populations.

Population estimates we have reported do not include subadult birds (one-year-old birds with subadult plumage [Grant 1986]) or nonbreeding adult birds (≥two-years-old). Consequently, the total population of Laughing Gulls is higher than our reported values.

Disparity in survey techniques, intensity of searches, and the time surveys were conducted precluded statistical analyses of data. Direct comparisons between surveys even within a state were often confounded because of different data collection methods. Although survey techniques are continually improving, there is obvious need for interstate and international coordination of techniques to allow direct comparisons and eliminate or reduce biases (see Erwin *et al.*, 1984). Therefore, population estimates and rates of population growth presented in this report should be used with caution.

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Laughing Gulls in flight in New York

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